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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,879	11/27/2002	Christopher A. Newton	BUR920010144	5280
30449	7590	11/01/2004	EXAMINER	
SCHMEISER, OLSEN + WATTS			LUND, JEFFRIE ROBERT	
SUITE 201			ART UNIT	
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LATHAM, NY 12033			1763	

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/065,879	Applicant(s) NEWTON ET AL.	
	Examiner Jeffrie R. Lund	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-17,19 and 20 is/are pending in the application.  
4a) Of the above claim(s) 13-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,17,19 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                        |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____   |

## **DETAILED ACTION**

### ***Withdrawal of Finality***

1. In the Appeal Brief filed September 20, 2004 the Applicant pointed out that claims 3 and 19 have not been addressed, and the Examiner noticed that the claims under appeal were not identical to the claims of record as a result of an After Final amendment that was filed on May 19, 2004 that was entered and contained amendments not intended by the applicant. Therefore, in order to clarify and complete the record, the finality of the office action of April 13, 2004 is withdrawn.

### ***Election/Restrictions***

2. Applicant's election with traverse of Group I, claims 1-12 and 17-20 in Paper No. 03/15/2004 is acknowledged. The traversal is on the ground(s) that all the claims could be searched without undo burden. This is not found persuasive because to search the method claims requires a completely different search, and how the art and case law is applied in rejections is completely different, thus requiring the examiner to conduct two distinct prosecutions, one for the apparatus claims, and one for the method claims.

The requirement is still deemed proper and is therefore made FINAL.

### ***Specification***

3. The disclosure is objected to because of the following informalities: in paragraph 53 in line 5 "X axis and a Z axis," should be amended to read -- X axis<sub>1</sub> and a Z axis<sub>1</sub>--, and in line 11 "thecenter" should be amended to read --the center--.

Appropriate correction is required.

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4. As discussed in the interview on October 25, 2004, the examiner has reviewed the application and found that the specification meets the requirements under 35 USC § 112, and no specific amendment is needed other than the minor typographical errors noted in paragraph 3 above.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 and 19 were amended in the After Final Amendment filed May 19, 2004. This amendment is not supported by the specification and does not particularly point out and distinctly claim the subject matter which the applicant regards as his invention.

Claim 19 recites the limitation "the paths" in line 1. There is insufficient antecedent basis for this limitation in the claim.

7. As discussed in the interview on October 25, 2004, the examiner has examined claims 3 and 19 as they were presented in the Appeal Brief and existed prior to the After Final Amendment of May 19, 2004. The claims as presented in the Appeal Brief, meet the requirements of 35 USC § 112 and no major amendment is required. However, claim 3 needs to be amended to correctly depend from claim 1 and claim 19 needs to be amended to correct the antecedent basis of "paths" as discussed above. The

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examiner understood that the applicant would amend these claims so that they read as they do in the Appeal Brief and have the correct dependency.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 3, 5-7, 9-12, 17, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitani et al, JP 3-281780, in view of Deacon et al, US Patent 5,792,269.

Mitani et al teaches an apparatus that includes a chamber 15 adapted for holding a workpiece having a surface layer; a gas distribution plate 112 with a first plurality of channels with a first angle of 90 degrees in a first groove 22 for providing a first fluid to the chamber and a second plurality of channels with a second angle of 90 degrees in a second groove 23 for providing a second fluid to the chamber. The channels are arranged in rings around a common center point of the distribution plate. The workpiece is separated from the gas distribution plate a distance of 3/16 to 9/16 of an inch. The rings have a diameter of more than 1.75 inches to about 7.04 inches. The grooves have a greater volume than the channels. The channels are arranged in a circle. (Figures 1 and 2 and throughout the specification, specifically, working example 1)

Mitani et al differs from the present invention in that Mitani et al does not teach that the channels form a flow at an angle of 45 to less than 90 degrees with respect to the surface of the distribution plate and/or with respect to the XY plane, the flow path is offset from the XY plane at an offset angle  $\alpha$  and  $\beta$  at an angle of about 0 to about  $\pm 45^\circ$ , an annular ring constricting the exhaust gases between the ring's edge and the wall of the chamber, the size of the constriction, and the type of gas supplied to each channel.

Deacon et al teaches channels 41 that are angled at 72 degrees, and includes an annular ring (baffle plate) constricting the exhaust gases between the ring's edge and the wall of the chamber. (Entire document) Deacon et al also teaches various hole patterns one of which includes a flow at an angle of 45 to less than 90 degrees (i.e.  $72^\circ$ ) with respect to the XY plane, and the flow path is offset from the XY plane at an offset angle  $\alpha$  and  $\beta$  (as defined in the applicant's specification in paragraph 53) at a range of angles 0 to  $\pm 45^\circ$  (see figure 19).

The motivation for angling and offsetting the channels of Mitani et al is to improve step coverage as taught by Deacon et al. The motivation for adding the annular ring is to improve the uniformity of the exhaust gas flow by providing a restricted area that equalizes the suction applied by the vacuum pump to the chamber. The motivation for making the constriction at least 3/8 of an inch is to optimize size of the constriction. Furthermore, it was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed

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relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04

(d)) The motivation for supplying a specific gas to each channel is to deposit a specific layer.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to angle and offset the channel of Mitani et al, and add the annular constricting ring of the correct size to the apparatus of Mitani et al, as taught by Deacon et al, and to supply the desired process gases to deposit the desired layer.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitani et al and Deacon et al as applied to claims 1, 3, 5-7, 9-11, 17, 19, and 20 above, and further in view of Plavidal et al, US Patent 5,718,795.

Mitani et al and Deacon et al differs from the present invention in that they do not teach that the dispersion plate is made of polytetrafluoroethylene.

Plavidal et al teaches that the dispersion plate is made of polytetrafluoroethylene (Teflon®) (column 4 lines 48-49).

The motivation for making the dispersion plate out of polytetrafluoroethylene is to provide a material of construction, which is required but not disclosed by Mitani et al and Deacon et al. Polytetrafluoroethylene is well known in the art and is used because it is chemically inert.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the dispersion plate of Mitani et al and Deacon et al out of polytetrafluoroethylene as taught by Plavidal et al.

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11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitani et al and Deacon et al as applied to claims 1, 3, 5-7, 9-11, 17, 19, and 20 above, and further in view of Hasegawa et al, US Patent 5,837,093.

Mitani et al and Deacon et al differs from the present invention in that they do not teach an annular ring that includes a plurality of holes extending over an exhaust port.

Hasegawa et al teaches an annular ring 29 that includes a plurality of holes 30 extending over an exhaust port 31.

The motivation for adding the annular ring with a plurality of holes of Hasegawa et al in the apparatus of Mitani et al and Deacon et al is to improve the uniformity of the flow across the wafer and to the exhaust port, thereby improving the uniformity of the processed wafer.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add annular ring of Hasegawa et al to the apparatus of Mitani et al and Deacon et al.

### ***Response to Arguments***

12. Applicant's arguments filed September 20, 2004 have been fully considered but they are not persuasive.

In regard to the applicant's, that the "Examiner has not identified any teaching or suggestion in the prior art for combining planar coverage and step coverage in one apparatus. Secondly, the Examiner has not identified teaching or suggestion in the prior art indicating that it would be more economical to combine planar coverage and step coverage in one apparatus. Thirdly, the Examiner has not presented evidence



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showing that modifying Mitani et al. by using Deacon's angled jets of fluid would not destroy Mitani's excellent  $\pm 3\%$  planar coverage", the Examiner agrees. The Examiner never intended to suggest that the combination of Mitani et al and Deacon et al would enable the apparatus of Mitani et al and Deacon et al to perform planar coating and step coverage at the same time with the same showerhead. The apparatus of Mitani et al unmodified can be used to coat both a planar wafer and one with various topographic features (i.e. side walls). While the apparatus of Mitani et al does an excellent job at planar coverage, it suffers from the problems discussed by Deacon et al in the prior art section (see figures 1-3a and column 1 line 10 through column 3 line 10) when it is used to coat a wafer having sidewalls and requiring step coverage. Therefore, one of ordinary skill in the art seeking to improve the ability of the apparatus of Mitani et al to process substrates with sidewalls would be motivated to modify the nozzles as taught by Deacon et al. This is commonly done in the art because each method requires specific operating conditions and the apparatus must be optimized to maximize its performance, and it allows a single coating chamber to perform multiple coating methods, thus removing the need for having a single apparatus for every possible method.

In regard to the argument that there is no motivation to combine Plavidal et al with Mitani et al and Deacon et al because there is no requirement for a chemically inert material of construction, the Examiner disagrees. As pointed out by the applicant, neither Mitani et al nor Deacon et al teach a material of construction. For the

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showerhead to exist, it must be made of something, and contrary to the assertion made by the applicant, that:

“Appellants respectfully dispute that the motivation to combine Mitani et al and Deacon et al with Plavidal et al is the need to provide a chemically inert material of construction, because, nowhere do Mitani et al or Deacon et al teach or suggest that the distribution plate requires a chemically inert material of construction.”

the showerhead must be made from a chemically inert material. This is a fundamental limitation, and well known in the art. The apparatus will not function if the chemicals within the apparatus react to the apparatus. If the chemicals react with the apparatus, the apparatus will be destroyed, and will also contaminate any wafers that are processed in it. Furthermore, all the materials commonly used to make a showerhead in the art are chemically inert. This is known and obvious which is why it is not mentioned in Mitani et al or Deacon et al.

In regard to the argument that the rejection of claim 8 is improper because of lack of motivation to combine Mitani et al in view of Deacon et al with Hasegawa et al, the Examiner disagrees. The well-known purpose for using a baffle plate (i.e. a lower annular ring that includes a plurality of holes) over an exhaust port is to control the flow of gas through the exhaust port. It is a fundamental principle of fluid flow that the closer the fluid is to the negative pressure source (i.e. the exhaust port) the faster the fluid flows. Thus in a processing chamber without a baffle plate, the gas near the exhaust port will flow faster than the gas further from the exhaust port. This uneven flow causes

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the wafer to be processed unevenly. By adding a baffle plate, the flow can be equalized by causing the negative pressure to be evenly space around the wafer (i.e. small holes equally spaced around the wafer which constrict the flow by keeping the flow rate below that of the exhaust port) or by equalizing the flow (i.e. small holes near the exhaust port and larger holes opposite the exhaust source which equalizes the exhaust flow). This is well known in the art, which is why Hasegawa et al does not more fully describe the baffle plate.

The Examiner notes that all the arguments are based on the Examiners motivation to combine the references, and that the motivation must come from the references. First, while it is proper to review and question the motivation to combine, it is better to identify and point out any structural difference between the claimed invention and the combination of references. If no such structural differences are identified and pointed out, it must be assume that there are no structural differences between the claimed invention and the combination of references. Second, the applicant is incorrect in the assertion that the motivation must be supplied by the prior art. The MPEP clearly states that:

- a. "There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." (*In re Rouffet*, 149 F.3d 1350, 1357, 47USPQ2d 1456, 1457-58 (Fed. Cir. 1998) See MPEP2143.01

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- b. "The rationale to support a rejection under 35 U.S.C. 103 may rely on logic and sound scientific principle." (*In re Soli*, 317 F.2d 941, 137 USPQ 797 (CCPA 1963) See MPEP 2144.02
- c. "...there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify or combine reference teachings..." (MPEP 2145.X.C.)
- d. "...that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art." See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). (MPEP Form Paragraphs 7.37.04)

### **Conclusion**

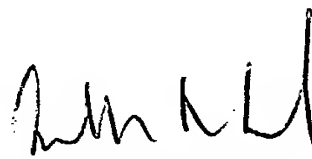
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches the technological background of the invention. The cited art contains patents that could be used to reject the claims under 35 USC § 103. These rejections have not been made because they do not provide any additional or different teachings, and if they were applied, would have resulted in an undue multiplication of references. (See MPEP 707.07(g))

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jeffrie R. Lund  
Primary Examiner  
Art Unit 1763

JRL  
10/28/04